REMARKS/ARGUMENTS

Reconsideration and allowance of the subject application are respectfully requested.

Claim 1 has been amended. Claim 16 has been cancelled without prejudice or disclaimer. Claim 8 remains withdrawn. Claims 1, 3, 5 to 7, 9, 10, 12, 14 and 17 stand for consideration in the subject application. Claim 1 is independent.

In the Official Action, the Examiner has raised an objection to the drawings as failing to comply with 37 CFR 1.84(p)(5). A replacement drawing page including amended Figure 7 has been submitted herewith to address this objection.

The Examiner has rejected claims 1, 3, 5 to 7, 9, 10, 12, 16 and 17 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description and enablement requirements. Claim 16 has been cancelled and claim 1 has been amended to address these rejections.

The Examiner has rejected claims 1, 3, 5 to 7, 9, 10, 12, 16 and 17 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter what the Applicant regards as the invention. Claim 1 as amended provides proper antecedent basis for the term "intersection". Claim 16 has been cancelled. Again, with respect to the Examiner's rejection to the phrase "video signal gray level data" in claim 1, Applicant respectfully submits that this rejection is without merit. One of ordinary skill in the art would have no difficulty understanding the claimed subject matter. This claimed expression is not unclear as alleged. Introducing the "data" element without the use of an indefinite article is proper and does not render claim 1 unclear. Accordingly, Applicant respectfully requests that this rejection be removed.

With respect to prior art, the Examiner has rejected claims 1, 3, 5 to 7, 9, 10, 12, 16 and 17 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,049,320 to Yeo ("Yeo") in view of U.S. Patent No. 6,380,919 to Koyama et al. ("Koyama"), U.S. Patent No. 6,844,874 to Maurice ("Maurice"), PCT Application No. WO 01/61677 to Cheng ("Cheng"), U.S. Patent No. 6,417,825 to Stewart et al. ("Stewart") and U.S. Patent No. 5,440,208 to Uskali et al. ("Uskali"). Applicant respectfully submits that the Examiner's rejection in view of the cited references is without basis.

At the onset, Applicant wishes to remind the Examiner that it is impermissible for

the Examiner to use the Applicant's claims as a roadmap to pick and chose from the cited references to sustain a finding of obviousness while disregarding the teachings of the references as a whole. This hindsight combination of references is improper and clearly contrary to well established law. It appears clear that the Examiner is using hindsight to reject the claims in view of the cited references. When the cited references are considered for what they actually teach, Applicant respectfully submits that the cited references do not render obvious the Applicant's invention as claimed.

Independent claim 1 recites a gray scale column driver circuit for an alternating current dielectric electroluminescent display comprising rows, columns that intersect the rows and pixels at the intersections of the rows and columns. The gray scale column driver circuit comprises a counter receiving video signal gray level data and in response counting for a time interval proportional to the gray level data. A non linear analogue voltage ramp generator is connected to the counter. The non linear voltage ramp generator outputs a ramping voltage during the time interval. The ramping voltage conforms to a curve with an initial convex portion followed by a concave portion. The initial convex portion conforms to a negative second derivative with respect to the time interval, and the concave portion conforms to a positive second derivative with respect to the time interval. A column driver receives the ramping voltage and in response applies driving pulses to the columns of the dielectric electroluminescent display. The ramping voltage determines a maximum voltage of the alternating polarity driving pulses applied to the columns of the dielectric electroluminescent display by the column driver.

Yeo discloses a gray scale driver for an active matrix liquid crystal display wherein a current flows to charge a pixel capacitor to a voltage that is non-linear with respect to time in accordance with the desired grey level. A pixel in a liquid crystal display consists of a layer of liquid crystal sandwiched between two optically transparent electrodes. The liquid crystal layer functions as a light valve to modulate the fraction of light from back-light passing through the valve to achieve the desired grey level. The fraction of light passed by the liquid crystal layer is dependent in a non-linear fashion on the voltage applied across the liquid crystal film. In the active matrix liquid crystal display (AMLCD) as taught by Yeo, the pixels are independently controlled by a thin film transistor (TFT) connected in series with each pixel. The pixel itself behaves electrically as a capacitor. The voltage across the pixel capacitor is set by allowing a current to

pass through the TFT until the prescribed voltage is reached, at which time the TFT is switched off by an abrupt change in the voltage applied to the gate of the TFT. The voltage across the pixel then remains constant for the duration of a video frame at which point the TFT is turned on again to allow the voltage across the pixel to be reset in accordance with the grey level required for the next frame. The voltage applied across the pixel as a function of time while the TFT is turned on as taught by Yeo is non linear as shown in Figure 2a in order to accommodate the non linear relationship between the voltage and the fraction of light transmitted by the pixel. The voltage however is applied **directly** to the data (column) lines of the liquid crystal display to provide gray level control. The voltage is **not** applied to a column driver of a gray scale column driver circuit as claimed.

Koyama discloses a display device comprising a plurality of pixels arranged in matrix form. Two or more row driving and/or column driving circuits are aligned parallel to each other. This arrangement serves to reduce intervals between rows and/or columns driven by each of the parallel driving circuits so that the pixels of the matrix can be arranged at a higher density. With this parallel arrangement of the driving circuits, interlaced scanning as well as line inversion and dot inversion of video signals are simplified and the operating frequency of the driving circuits can be reduced.

Maurice discloses an AMLCD wherein the maximum current passing through the TFTs connected in series with the pixels is limited to avoid excessive power loss due to the electrical resistance of the TFTs. Maurice also makes reference to an alternate embodiment of the means used to limit the current as applied to an electroluminescent element. However, it is clear from the discussion of Maurice that Maurice is referring to a direct current (dc) electroluminescent element, as shown in Figure 3 and described at column 5, lines 23 to 28. Note that in Figure 3 the voltage across the electroluminescent element always has the same polarity. This type of electroluminescent element, as is well known in the art, consists of a phosphor layer sandwiched between two electrodes so that a dc current can be passed through the electroluminescent element.

Cheng discloses a driving circuit for powering an electroluminescent display using energy recovered from a varying panel capacitance of the display. The driving circuit comprises a source of electrical energy, and a resonant circuit using the panel

capacitance for receiving the electrical energy and in response generating a sinusoidal voltage to power the display at a resonant frequency which is substantially synchronized to a scanning frequency of the display. The resonant circuit uses a step down transformer to reduce the effective panel capacitance of the display in order to reduce its effect on the resonance frequency.

Stewart discloses an active matrix electroluminescent display (AMEL display) that produces gray scale operation comprising an array of pixels, each pixel including a first transistor having its gate connected to a select line, its source connected to a data line, and its drain connected to the gate of a second transistor. The second transistor has its source adapted to receive a ramped voltage level, and its drain connected to a first electrode of an electroluminescent cell. The electroluminescent cell has a second electrode connected to an alternating current, high voltage power source. The electroluminescent cell is illuminated when the ramp voltage level is less than a voltage level on the gate of the second transistor. The ramp voltage level is increased linearly during a frame duration, and the alternating current, high voltage power source is on continuously during the same frame duration. The alternating current, high voltage power source may also be varied in amplitude from a minimum peak-to-peak value to a maximum peak-to-peak value during the frame duration.

Uskali discloses an electronic device including an electroluminescent backlight panel and an EL driver circuit. The EL driver circuit provides power to the EL backlight, as well as panel aging compensation and user adjustment capabilities. The EL driver circuit is low-cost, small-size, and designed in such a way to be easily integrated into a custom integrated circuit.

The Examiner asserts that one of ordinary skill in the art would employ column drivers as taught by Koyama, Maurice, Cheng and Uskali in the Yeo liquid crystal display to arrive at the Applicant's invention as claimed. Applicant respectfully submits that there is no basis for this assertion. Yeo expressly teaches to apply the non linear voltage directly to the data lines of the display. As such, Yeo has no need for the column drivers of Koyama, Maurice, Cheng and Uskali and thus, one of ordinary skill in the art would have no motivation to combine the references as alleged. In any event, none of the cited references teaches or suggests a gray scale column driver circuit comprising a column driver that receives the output of a non linear voltage ramp

generator. The Maurice device is a dc electroluminescent element that is **not** amenable to gray scale control through curved voltage ramps. Rather gray scale control is effected by pulse width modulation.

The Koyama, Stewart and Uskali devices appear to make use of linear voltage ramps and the Cheng device is silient as to voltage ramps applied to the column driver.

By contrast, Applicant's invention relates to a gray scale column driver circuit for an alternating current dielectric electroluminescent display, wherein the counter and voltage ramp generator are used to generate reference voltage levels for each gray level that are applied to a conventional column driver (see paragraph [0036]). None of the cited references, either alone or in any combination, teaches or suggests ***a ramping voltage generated by an analogue voltage ramp generator that conforms to a curve having an initial convex portion followed by a concave portion, wherein the initial convex portion conforms to a negative second derivative with respect to the time interval, and the concave portion conforms to a positive second derivative with respect to the time interval with the ramping voltage determining the maximum voltage of alternating polarity driving pulses applied to the columns of the dielectric electroluminescent display and a column driver receiving the ramping voltage and in response applying driving pulses to the columns of said dielectric electroluminescent display, wherein said ramping voltage determines a maximum voltage of the alternating polarity driving pulses applied to the columns of said dielectric electroluminescent display***, as recited. Accordingly, Applicant respectfully submits that independent claim 1 and the claims dependent thereon distinguish patentably over the cited prior art and should be allowed.

In view of the above, it is believed the application is in order for allowance and action to that end is respectfully requested.

CONCLUSION

For at least the reasons detailed above, it is respectfully submitted that all claims remaining in the application (Claims 1, 3, 5-7, 9, 10, 12, 16 and 17) are now in condition for allowance. The foregoing comments do not require unnecessary additional search or examination.

☒ Remaining Claims, as delineated below:

(1) FOR	(2) CLAIMS REMAINING AFTER AMENDMENT LESS HIGHEST NUMBER PREVIOUSLY PAID FOR		(3) NUMBER EXTRA
TOTAL CLAIMS	**17**	**- 20 =**	**0**
INDEPENDENT CLAIMS	**1**	**- 3 =**	**0**

☒ This is an authorization under 37 CFR 1.136(a)(3) to treat any concurrent or future reply, requiring a petition for extension of time, as incorporating a petition for the appropriate extension of time.

☒ The Commissioner is hereby authorized to charge any filing or prosecution fees which may be required, under 37 CFR 1.16, 1.17, and 1.21 (but not 1.18), or to credit any overpayment, to Deposit Account Number 06-0308.

In the event the Examiner considers personal contact advantageous to the disposition of this case, he/she is hereby authorized to telephone John S. Zanghi, at 216.363.9000.

Respectfully submitted,
Fay Sharpe LLP

12/21/10
Date

John S. Zanghi, Reg. No. 48,843
The Halle Building, 5th Floor
1228 Euclid Avenue
Cleveland, Ohio 44115-1843
216.363.9000

CERTIFICATE OF MAILING OR TRANSMISSION	
I hereby certify that this correspondence (and any item referred to herein as being attached or enclosed) is (are) being ☒ transmitted to the USPTO by electronic transmission via EFS-Web on the date indicated below.	
	Signature: Elaine M. Checovich
Date: 12-21-10	Name: Elaine M. Checovich

N:\SMBZ\200980US01\emc0010266V001.docx